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Bizarre Theories Flourish On Science's Money Woes

Rich in hallucinations and short on evidence and logic, a party line is evolving among the national chieftains of basic research to explain the financial and political disappointments of science in recent dealings with Washington.

The woes of science, they contend, are mainly attributable to a scientifically ignorant public that is increasingly hostile to science, plus the loss of Cold War support for research. Deficit reduction is unavoidably recognized as another malign factor, though little attention is given the fact that science has actually fared better than virtually all other government activities since Congress and the White House agreed to restrain discretionary spending.

With these burdens weighing on science, the mandarins lament, the effects are sluggish federal budgets, skeptical Congressional questioning of the value and goals of research, and the premier catastrophe of science and government, the

Science Chief from Bush's OMB Scores Clinton's R&D Budget—P. 5

termination of the Superconducting Super Collider (SSC). The inventory of difficulties usually leads to the conclusion that a relationship that once worked well is in disrepair or broken, and that political support of science is now narrowly based on misguided expectations of economic utility.

In this simple but prevalent formulation, the origin of the problem is clear: scientific ignorance among laymen, in the masses and in politics. And so is the proposed remedy: scientific missionary work, in Congress, schools, the press, museums, and elsewhere, to educate and convert the untutored leaders and masses into supporters of science. The operational conviction in this matter is that understanding of science will translate into support, and money, for science—though no evidence exists of a correlation between scientific understanding and scientific budgets.

In the words of Nobelist Leon M. Lederman, who in the past has asserted that all qualified scientists merit government research support, "It's time to attack." Writing in the March *Physics Today*, Lederman calls for scientists to recognize "a need for a more science-literate public." To which he adds: "I do not believe scientists should cringe and accept that in the post-cold-war era, science is no longer needed unless it is directed toward a specific goal by the appropriate subcommittee of Congress."

In that same journal, Wolfgang K.H. Panofsky, patron saint of the Stanford Linear Accelerator Center (SLAC),

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NIH Takes a Beating at Dingell's Cancer Hearing

Chairman John Dingell applied the Congressional version of Singapore justice last week to top officials of the National Institutes of Health as he held hearings on NIH's admittedly sluggish response to inept management of cancer research at the University of Pittsburgh.

The impresario of that research, the fabled Bernard Fisher, now suspended from NIH responsibilities, declined Dingell's invitation to attend, on grounds of ill health, and the university did not send anyone in his stead. The Congressman, whose default setting is seething scorn, therefore concentrated his ire on those who did show up before his Oversight and Investigations Subcommittee: NIH Director Harold Varmus and the Director of the National Cancer

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In Brief

Odds on the Space Station surviving much longer are rapidly sinking as Chairman George Brown, of the House Science, Space, and Technology Committee, continues to argue that unless more money is forthcoming, the project must be terminated to avoid starvation throughout NASA. Brown is pressuring the White House to move quickly to save the Station. However, under the tight budgeting rules that now constrict federal spending, there's no loose change in Washington.

There's a big fight shaping up over the close-down costs for the Superconducting Super Collider. Texas says it wants to recoup its contributions to the project, while the Department of Energy, which presided over the fiasco, says that it may cost nearly $1 billion to wind up all contracts, pay severence salaries, and meet other costs. DOE seems quite relaxed about continued spending on the SSC. It recently awarded the Texas National Research Laboratory Commission "up to $6 million" to study possible future uses of the SSC site. One proposal in the hopper is to grow mushrooms in the tunnel. Rep. Sherwood Boehlert (R-NY), the leading nemesis of the SSC, is closely watching the termination grab.

Now under way, with results to be published in May, a readership survey in *Engineering Times*, monthly of the National Society of Professional Engineers. First question: "Is there a need to reduce the number of graduates coming from US engineering schools?" Among the options raised for consideration: "Limiting enrollment of international students."

Which brings up the latest definition of American mathematics: Russian professors teaching Chinese students.

. . . Surveys Show Strong Public Support for Science

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offers a new theory of the SSC debacle. It was brought about, he suggests, through meddling by Department of Energy administrators, compounded by Congressional harassments, which together ran up the costs to the point where the project foundered in anti-deficit politics.

Panofsky gives little weight to Congressional disillusionment with the SSC promoters' unfulfilled assurances of substantial foreign money for the project, or their repeated upward reassessments of the costs, from $4.4 billion at the outset, to over $11 billion, and rising, when Congress finally balked.

Panofsky concludes that "above all, it must be recognized that science needs government, and government needs science, and thus restoration of the science-government partnership is essential"—a curious conclusion, given that the US Treasury still pays the bills for SLAC, budgeted this year for $135 million in operating costs, plus construction funds.

The theme of public ignorance and distrust as a source of political difficulties for science has become the official line of the White House Office of Science and Technology Policy, as enunciated April 6 by M.R.C. Greenwood, OSTP's Associate Director for Science. Speaking to the American Association for the Advancement of Science annual Colloquium on Science and Technology Policy, Greenwood declared that "there is now greater skepticism, more misinformation, and in some cases naivete about the societal relevance and economic value of foundational pioneering research than at any time since 1945."

Urging researchers "to explain science and technology to the American people," Greenwood said, "We must clearly and concisely articulate the intimate relationship between the pursuit of foundational science and the long-term health, intellectual capital, longevity, and prosperity of the nation. We must communicate this persuasively to a public that in some ways is currently disenchanted with science." Greenwood offered no citations for her deeply dour assessments of public attitudes toward science.

What is really happening in relations between science and the public? In this large and noisy country, it is difficult to know precisely. But a good deal of objective data exists on these subjects. And it suggests that some of the esteemed leaders of science are talking nonsense, but doing it so often that repetition has created an illusion of reality.

Opinion surveys are suspect on many grounds, but when the results are similar in many surveys over many years, some credence may be warranted. None of the doomsayers encountered by SGR have referred to survey data. However, there's a lot of it on public attitudes toward science and scientists, much of it commissioned by research organizations worried about public sentiments.

The major surveys on this subject, from various sources, are regularly included in *Science & Engineering Indicators*, the biennial bible of R&D statistics published by the National Science Board, the policymaking body of the National Science Foundation. The latest edition, published in January, is in harmony with its many predecessors in reporting extremely strong levels of public approval and support for science and scientists.

The "scientific community" has always ranked at or near the top in a survey series on confidence in major institutions conducted since 1972 by the National Opinion Research Center. In 1993, for example, 41 percent of the respondents expressed "great confidence" in the scientific community, a point ahead of "medicine" and nine points ahead of the Supreme Court. The leader that year, with 43 points, was the military, boosted by the Gulf War, but normally down in the low-30s range.

In a survey sponsored by the Chicago Academy of Sciences in 1992, 85 percent agreed that "science and technology are making our lives healthier, easier, and more comfortable"—a figure that has varied little since 1983. In 1983, 57 percent agreed that "the benefits of science are greater than any harmful effects." In 1992, agreement with that statement rose to 73 percent. Seventy-nine percent agreed that "Most scientists want to work on things that will make life better for the average person."

Asked to rate preferences for various categories of government spending, 34 percent thought "too little" is spent on scientific research, while 19 percent thought "too much." Space exploration fared poorly in that line of questioning, with 50 percent of the respondents saying it receives too much, while 12 percent said too little.

Strong but shrinking pro-science sentiments were found in surveys of high school seniors by the Social Science Research Institute at Northern Illinois University. In 1990, 68 percent agreed that "Scientific invention is largely responsible for our standard of living in the United States." By 1993, agreement had dropped to 62 percent, while the undecideds had risen from 29 to 35 percent.

These and other surveys suffer from the difficulties of using simple questions to divine sentiments on complex issues. But the notable fact is that all the surveys indicate strong support for science, and none of them suggest substan-

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. . . A Lot of Research Thrived Apart From Cold War

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tial disapproval, let alone hostility. What, then, is the basis for the unending stream of assertions of public antipathy to science, the claims of disenchantment, and related lamentations in this flourishing genre?

The plain answer is that there is no basis in fact. But even scientists must have something or someone to blame for their disappointments, and in herd-like fashion, the savant mob has signed on to the collective delusion of ignorance-based hostility as the demon factor in what they nostalgically represent as an idyllic partnership gone sour. The record shows, of course, that, even in the best of years, the management of science has never been satisfied with the budgets coming out of Washington—and has routinely attributed the deficiencies to lack of understanding among the paymasters. The stupidity theme has now ascended to holy dogma, with various appendages to provide theoretical heft.

Along with the dumb public, the end of the Cold War has been grasped by the scientific leadership as a major part of the explanation for Washington's failure to provide more money for research.

With occasional reliance on historical reality, the argument runs as follows: Science flourished as part of the nation's blank-check challenge to Soviet expansion, because our political chiefs realized that leadership in research was indispensable for military superiority. But the collapse of the Soviet Union has deprived science of a simple, easily understood rationale for government support. The most politically appealing candidate so far is science for economic security as the successor to science for military security. But the science establishment, particularly its academic wing, views that concept as a threat to the cherished system of investigator-initiated project research. Accordingly, it has strongly resisted the efforts of Senator Barbara Mikulski (D-Md.) and Rep. George Brown (D-Calif.) to link science tightly to economic utility and societal needs. The leaders of science have come around to the view that it's their friends, rather than their enemies, who are truly worrisome.

The theme of Cold War withdrawal pains, and salvation through usefulness, resounds from many platforms these days. It was parroted in January by one of Congress's most devoted supporters of science, Senator John D. Rockefeller (D-W.Va.), in an address to the Forum on Science in the National Interest [SGR, February 15]. "After decades in which defense was *the* priority of federal science and technology policy," Rockefeller said, "now our goal is to use the talents of our nation's superb scientists and engineers to help generate what's at the core of life, liberty, and the pursuit of happiness for Americans—enough good jobs and growth for all."

National security did indeed underpin much of science and technology throughout the Cold War, but a good deal of government-supported S&T has thrived outside the defense perimeter for many years. The National Institutes of Health has always existed in its own political sphere, with its budget rising from $1.5 billion in 1970 to $11.5 billion this year. The research budget in the Department of Agriculture is close to $2 billion. The Environmental Protection Agency is budgeted next year for over $500 million for research, and another billion plus in research can be found in the combined budgets of the Interior and Commerce Departments and various other civilian agencies.

Cynics might say that the National Science Foundation, now at $3 billion a year, has functioned as an academically acceptable front for the military-industrial complex, financing the training of scientists and engineers for defense industries and promoting basic research that leads to weapons systems. That's one way of looking at it. But with the Cold War over, NSF continues to grow financially at a pace exceeding most other federal agencies.

NASA was, of course, a creature of the Cold War, established in response to Sputnik to catch up with and beat the Soviets in space. But, to NASA's loss, the competitive rationale has worn away. Nonetheless, NASA is still there, with the biggest budget, $14 billion, of any civilian R&D agency, concentrating on planetary research, the politically doomed Space Station, and scientifically and technically arid shuttle flights.

R&D's one indisputable loser from the end of the Cold War is the Department of Energy's trio of weapons labs, Los Alamos, Livermore, and Sandia. With nuclear weapons no longer produced or tested, this multi-billion-dollar complex faces a bleak future, despite desperate efforts to acquire industrial customers. But outside of its weapons work, DOE is a major performer of purely civilian research, with over $2 billion a year for energy R&D and $1 billion in the category of general sciences, which includes nuclear and high-energy physics.

When all the numbers are accounted for, doesn't the Pentagon remain the king of federal R&D? It may look that way, but the numbers are misleading—and always have been. Of the $73 billion that Clinton has requested for R&D for next year, $36 billion is designated for the Defense Department. Relatively little of DoD's budget, however, has ever been for what is generally regarded as scientific research. The Pentagon's basic-research support, categorized as 6.1 programs in the budget book, has been around the $1 billion mark for several years. The 6.2 category, which tends in the direction of applied research, is budgeted for about $3 billion. The rest of the money is mainly for the engineering and testing of weapons systems.

The end of the Cold War has produced little change in the Pentagon's scientific role, which was never very large. DoD's role in civilian technology is increasing because the money and staffs are there to carry out the Clinton Administration's high-tech industrial-promotion policies. But that has little or nothing to do with basic science.

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After Initial Chill, Carnegie Director Warms to Clinton

For a quick course on how the science establishment is adjusting to Bill Clinton and his strong emphasis on technology, let's look at the evolution of attitude in one of the senior members of the permanent Washington science establishment, Maxine Singer, President of the Carnegie Institution of Washington, an elite, private constellation of basic-research laboratories. One of the few women in the National Academy of Sciences, and a former member of the NAS Council, Singer is a pillar of the national science establishment.

Last November, she went on record with a gloomy assessment of the science policies of the then-eight-month-old Clinton Administration, expressing strong views in a foreword to Carnegie's annual report for fiscal year 1992-93—published just a few weeks ago. Her views paralleled those of many other scientists—with the difference that she went public while most others complained privately.

Singer wrote that she and many Carnegie colleagues "are concerned that the current national emphasis on technological development is weakening support for fundamental science.

"Thus, we noted with some dismay," she continued, "that at the very interesting and successful 'economic summit' held in Little Rock by the then new national administration, science was one of the few endeavors not represented. Technology was there, but not science. Meanwhile, among the large circle of 'Friends of Bill' reported in the media, no scientist appears."

Singer continued: "Influential Members of Congress are so concerned about short-term technological payoffs that they are minimizing the importance of the underlying advances in fundamental knowledge. It has seemed at times as though the scientific community is becoming marginal, integrated neither personally nor philosophically into the national life.

"Even the participation of the President and Vice President in the wonderful White House ceremony where our [Carnegie] colleague Vera Rubin received the National Medal of Science in the fall of 1993, generated only the briefest press reports and failed to dissipate the gloom."

The one hopeful note in her remarks concerned the appointments of Harold Varmus to head the National Institutes of Health, Neal Lane as head of the National Science Foundation, and John Gibbons as Presidential Science Advisor. "Strong and able," she termed them, expressing hope that they would "establish with President Clinton a collegial and visionary community"—and then reverted to gloomy matters.

Science's old friend in Congress, Chairman George Brown, of the House Science, Space, and Technology Committee, was off the mark, she said, in criticizing the scientific community "for failing to solve major national problems such as population, poverty, and ill health. In fact," Singer wrote, "many of these problems could be ameliorated by scientific knowledge already in hand; it is politics, not lack of scientific effort, that stands in the way."

Noting that Brown had urged scientists to lobby in behalf of science, Singer said: "In this he is contributing to the redefinition of science as yet another special interest. Perhaps this is inevitable; our country is, these days, being fragmented into individual political communities. Yet, scientists have always thought that the pursuit of new knowledge was universal, not a special interest."

SGR asked Singer last week how her views of last November have weathered. "My attitude has changed somewhat," she replied. "The appointments to the major [research] posts have been good ones. And the President seems to have got some message. At least, he has learned to say the right words."

Singer said that Congressman Brown, as well as Senator Barbara Mikulski (D-Md.), who had similarly criticized science, seemed to have changed, as indicated by "remarks that are less threatening to the scientific enterprise."

Singer said, too, that she has had some second thoughts about recent political pressures on science. "National goals have always been a big factor in funding science," she observed, though less so at NSF.

On balance, Singer said, she is far more optimistic than she was last November. "There's been a transition among politicians," she said. "And I hope science will change, too."

Public Attitudes

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Science suffers from financial shortfalls, but these do not originate in public ignorance, lessened international tensions, or to any substantial extent in political demands for quick payoffs from government support. The new ironclad rules of deficit reduction are squeezing all discretionary federal programs, and before that broad anti-spending sentiments took their toll.

Nonetheless, since the mid-years of the Reagan Administration, science has consistently been singled out for favored treatment in Presidential budgets and on Capitol Hill. The outcomes have varied—NSF, in particular, suffers from its placement in a Congressional appropriations cluster that includes housing and veterans programs. But, in general, federal science budgets have continued to grow above the rate of inflation.

The good fortune of science, however, is not good enough to keep up with America's bountiful PhD production, greatly supplemented in recent years by immigration. Nor can the available money underwrite all the great possibilities on the frontiers of research.

When Washington has more money to dispense, science will get its share. Meanwhile, the chieftains of science should back off from demeaning theories that attribute the disappointments of science to public stupidity.—DSG

A Bush Budget Aide Scorns Clinton's R&D Claims

In or out of office, the science chiefs at the Office of Management and Budget rarely go public about federal research policy. In harsh tones, one of the few exceptions occurred April 6, when Robert E. Grady, OMB's head of Natural Resources, Energy, and Science in the Bush Administration, reviewed Clinton's R&D policies at the annual AAAS Colloquium on Science and Technology. Grady is now with the investment firm Robertson, Stephens and Company. Following are excerpts from his address, condensed by SGR, but close to verbatim.

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The numbers simply do not match the rhetoric—not even close. Overall, the FY '95 budget proposes to increase federal R&D spending by 3.3 percent, barely above the inflation rate; in real terms, 0.5 percent relative to inflation. As a point of comparison, President Bush's final budget presentation would have increased civilian R&D—which President Clinton has been stressing—by 7 percent. So, President Clinton is slowing the rate of increased investment in civilian R&D.

The FY '95 budget calls for a 6 percent increase for the National Science Foundation, a significant increase. But it also represents an abandonment of a commitment by two previous Presidents to keep NSF on a path to double its budget in each five-year time frame. President Bush's FY '93 budget requested an 18-percent increase for NSF. President Clinton's increase, which is trumpeted quite extensively in the budget documents, looks a little bit more like a slowdown.

NASA, already buffeted from yet another redesign of the Space Station, receives its first nominal cut in 20 years. And the President would reduce aeronautics R&D, one of the keys to US competitiveness. NIH is slated for a respectable 5 percent increase, enough at least to cover general inflation. But NIH is coming under other pressures, namely, a Congressionally mandated politicization of allocating biomedical research dollars aimed at tackling the HIV problem, through the newly reconfigured Office of AIDS Research.

Department of Energy research is essentially flat. The President deserves some credit for increasing, rather substantially, in fact, the investment in conservation R&D and some of the alternative energy programs and for certain worthwhile projects, for instance, Princeton's tokamak fusion reactor and other such investments.

The requested increases for both defense basic research and defense applied R&D—of 2 percent and 4 percent, respectively—in percentage terms actually outstrip the increases requested by President Bush in his last budget. Bush requested a 1 percent increase for basic defense, 3 percent for defense applied. This is notwithstanding the Administration's current rhetoric regarding restoring the balance in R&D spending in favor of civilian and at the expense of defense.

It's really only the National Institute of Standards and Technology (NIST) which is rewarded with a very, very substantial funding increase, in fact, a doubling relative to FY '94. Yesterday's *Wall Street Journal* reported that the increase comes with a few caveats, or maybe with a price attached to it, specifically that the agency now, for the first time in its history, has a politically appointed Director, the career person having been removed.

Perhaps, in the President's view, the campaign hasn't ended, because the same budget that promises to put us "on the cutting edge of research and technological advances," and charges its predecessors with "neglect of public investment in scientific and technical knowledge," proposes a real increase of exactly 0.5 percent in overall R&D investment, and a cut, in real terms, in civilian basic research. There's no continuation that I was able to discern of any federal initiative in the area of biotechnology, a growing and extremely important industry in this country and in our economy.

President Clinton is the first President in a generation to abandon the space program. Space Station Freedom is on its way to a slow death. As we saw in the Superconducting Super Collider fight, the Administration shows no understanding, let alone willingness, to wage the extremely difficult Congressional fights that are necessary to preserve a viable Space Station.

Another thing one cannot find is support for basic research, the backbone of America's knowledge advantage. Civilian basic research in this budget would increase by 2 percent in nominal terms—that's a cut in real terms. In President Bush's final budget, FY '93, it was slated to receive a 9 percent increase.

Finally, of course, there is no money for the now-cancelled Superconducting Super Collider, as we watch America's high-energy physicists head for CERN [the European Center for Nuclear Research]. I heard from an academic administrator the other day that the job market for physicists is wonderful, because it's a buyers' market.

Something else in this budget is missing, and that is any dividend whatsoever to science from the cancellation of the SSC. I point that out, because there's been a long-running debate in this town about the competition between big science and little science. There's not a dollar from that program that has found its way into another science program in this budget. That underlines the fact that the fight is not between big science and little science. The fight is between science and other priorities.

There's a relatively good explanation for the skimpy R&D budget. And that is that the discretionary caps are very tough and very binding. There are only two ways to increase this R&D budget. One is to decrease discretionary spending on other activities, like, for example, housing subsidies, which have been increased rather lavishly by this Administration; or to reduce entitlement spending. And that is why, when President Clinton promises a new Medicare program, not means tested, not financed, to pay for prescription drugs for, in some cases, rather wealthy senior citizens, people in this audience should see that as a direct attack on science and research and development, because that's what it is.

. . . NCI Says It Was Intimidated by Fisher's Renown

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Institute, Samuel Broder, plus an entourage of lesser officials from NIH. The termination of Varmus's honeymoon as chief of NIH can be recorded as of April 13, the date of the hearing.

Varmus and Broder were there to explain why several years elapsed before fraudulent data in a multi-center cancer trial administered by Fisher were publicly disclosed; also, why patients were not notified of the episode or of recently reported deaths in NCI-sponsored trials of tamoxifen, under study as a cancer preventive.

The NIH officials replied that the fraudulent data, ascribed to Dr. Roger Poisson, of St. Luc's Hospital, Montreal, did not affect the conclusion that lumpectomy and radiation are effective for breast cancer. They noted that the fraud, initially detected in 1990, was publicly revealed in the *Federal Register* in 1993, and in other obscure federal publications. Under questioning, they conceded that more prominent exposure would have been desirable.

As for new data about the dangers of tamoxifen, they mulishly insisted that the responsibility for informing patients belongs to the institutions carrying out the NCI-sponsored trials. They acknowledged that they didn't know for sure whether the patients had been informed, but said they surely hoped so.

Dingell and his colleagues were incredulous. Notification "is a simple moral question," Dingell insisted.

Varmus replied that "all sites have been notified to inform the patients," but, repeatedly, under close questioning, admitted the possibility that they have not been notified.

Dingell, who believes scientific misconduct is endemic and tolerated in the profession, commenced the four-and-a-half-hour proceedings with a statement peppered with references to fraud. "The case before us," he declared, "is a vivid reminder of how poor the response of the scientific community can be, and how serious the consequences may be when the scientific community and the federal government fall down on the job."

The NIH witnesses had little to say in their own defense, but some of what they did say only added to Dingell's perception of the scientific enterprise as a cozy cartel aloof from public scrutiny.

The Chairman stared in disbelief as Broder explained that "because of Fisher's formidable reputation," the NCI staff did not confront him directly when fraud was detected in the clinical trials under Fisher's administration. The tainted data were eventually eliminated, Broder said, without affecting the findings on lumpectomy.

Pressed by Dingell and other members of the Subcommittee to account for NCI's reluctance to crack down on Fisher, Broder confessed to an "excess of collegiality" in staff dealings with Fisher. He also said, "The staff felt Fisher had been right on a number of occasions and the results [of the trials] had not been affected" by Poisson's phony data.

The relationship between Fisher and NCI appeared to fascinate the Subcommittee members, for they pressed on with additional questions. In response, Broder brought up another facet of NCI's dealings with its grantee: When the fraud issue was brought to Fisher's attention, Broder said, the "response was quite disrespectful of the role government employees play." Fisher, according to Broder, said, "Who are you to criticize me?"

How did NCI respond? asked a member of the Subcommittee. The NCI staffers persisted, Broder said, and Fisher agreed to make some changes, "But it was a slow process," the NCI Director conceded, vowing that firmness would henceforth be the rule in dealings with NCI grantees and contractors.

Prior to NIH's turn at the witness table, a motif of scientific treachery against the cancer-fearing public was established by a panel consisting of two women, one a breast-cancer patient, from health advocacy organizations, and a 32-year-old woman who had recently undergone a lumpectomy.

In unison, they expressed anger, fear, and a sense of betrayal and declared, in emotional tones, that they found no comfort in assurances that a re-analysis of data from the breast-cancer trials showed that the outcome was not affected by Poisson's data.

"I take no comfort from the fact that the [Cancer] Institute that swept the fraud under the rug for three years now claims to have conducted a reanalysis of the study and maintains that the findings are still valid," said Jill Lea Sigal, who underwent a lumpectomy six months ago.

"For me," she said, "the National Cancer Institute has forfeited any claim to credibility.... As a result of the National Cancer Institute's behavior in this matter," Sigal continued, "I now question other policies of the National Cancer Insti-

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Broder Pledges Reforms

From NCI Director Samuel Broder's House testimony April 13 on fraud in the NCI-supported National Surgical Adjuvant Breast and Bowel Cancer Project (NSABP).

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Our staff also failed to mobilize after warning signs of delay in clearing up the scientific literature and repairing compliance with auditing requirements. This may have occurred because of ... NSABP's proud reputation, the visible status of Dr. Fisher in the scientific community and on our National Cancer Advisory Board, a self-consciousness in asserting authority over an independent investigator, or a mistaken belief that somehow the lapses by a senior research group were temporary. We are very sorry that this has happened and we assure you that such errors will not happen again.

In Print

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Human Genome 1993 Program Report (DOE/ER-0611P; 84 pp., no charge), from the Department of Energy, an update to DOE's *Human Genome 1991-92 Program Report* (DOE/ER-0544P), with summaries of 60 new or renewed projects, plus 112 continuing and 28 completed projects, for what the report describes as "the most complete published view of the DOE Human Genome Program through FY 1993."

Order from: Human Genome Management Information System, Oak Ridge National Laboratory, PO Box 2008, attn. Betty Mansfield, Oak Ridge, Tenn. 37831-6050; tel. 615/576-6669; fax 615/574-9888.

Water Pollution: Poor Quality Assurance and Limited Pollutant Coverage Undermine EPA's Control of Toxic Substances (GAO/PEMD-94-9; 87 pp., no charge), from the General Accounting Office (GAO), faults the procedures used by the Environmental Protection Agency to limit the discharge of toxic pollutants into waterways, saying EPA fails to collect adequate information to carry out its responsibility. The report says Congress should consider a prevention strategy to replace the present goal of attempting to limit the discharge of pollutants. The report was requested by Senator Frank R. Lautenberg (D-NJ), Chairman of the Environment and Public Works Committee's Subcommittee on Superfund, Ocean, and Water Protection.

Order from: USGAO, PO Box 6015; Gaithersburg, Md. 20884-6015; tel. 202/512-6000; fax 301/258-4066.

Critical Technologies Institute (CTI): 1993 Annual Report (14 pp., no charge), first annual report from a peculiar Congressional creation forced on the Bush Administration in 1992 as an appendage to the Office of Science and Technology Policy. Sponsored by Senator Jeff Bingaman (D-New Mexico), CTI was viewed in the Bush camp as another crafty device for enlarging the federal role in industrial technology through reports alleging dangerous deficiencies. After initial resistance and then much dickering, Bush finally gave in. Organizationally, however, CTI reflects its tortuous gestation, drawing its money from the National Science Foundation, administered by RAND, and reporting to OSTP. Doubts flourished as to whether the staff-stingy Clinton White House would tolerate CTI. But so far it's hanging on, with 12 professionals in Washington and six others at RAND headquarters in Santa Monica, according to this report, which briefly describes CTI studies related to the "clean car," space policy, machine tools, economic and industrial statistics, etc. In the division of labor, SGR hears, CTI performs at a scholarly pace while OSTP wallows in daily crises.

Order from: Critical Technologies Institute, RAND, 2100 M St. NW, Washington, DC 20037; tel. 202/296-5000, ext. 5692; fax 202/452-8377.

Cancer Hearing *(Continued from Page 6)*

tute, including its policy that women under the age of 50 should not get a mammogram unless they are at high risk."

Noting that she was not in a high-risk category, Sigal speculated whether a mammogram would have "caught my breast cancer at the earliest stage, when it was still contained within the duct and my chance of survival would have been approximately 98 percent." Sigal's testimony brought a hush over the crowded hearing room.

Sitting in with the Subcommittee were two members of Congress from the Women's Congressional Caucus, an increasingly potent group in biomedical-research politics. Both sounded quite angry. Rep. Olympia Snowe (R-Maine) declared that, in addition to shortcomings in the inclusion of women in clinical studies, "we now have lapses in ethics."

Rep. Pat Schroeder (D-Colorado) said, "I vote for medical research because I hope it will lead to good treatments, not to give scientists sandboxes to play in."

Referring to the NIH witnesses awaiting their turn to testify, Schroeder said, "Let's find some way to give them a message or shut off their money."

Of course, there's no thought of shutting off money for cancer research—quite the contrary. It can be argued, too, that the Pittsburgh episode, deplorable as it is, has been somewhat magnified by the volatile combination of cancer and Congressional theatrics.

But there should be no doubt that NIH has suffered losses of credibility and political confidence, extremely valuable commodities on Capitol Hill. The effects of these losses cannot be foreseen. But they dispose Congress to write more specific directives for NIH programs and, in the worsening battles for federal money, they don't strengthen NIH's claims for generous support.

Dingell said that witnesses from the University of Pittsburgh would be the stars at a forthcoming hearing, date to be announced.

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Official reports and other publications of special interest to the research community

(Copies of publications listed here are available from the indicated sources—not from SGR)

Research and Development FY 1995, from the American Association for the Advancement of Science (287 pp., $14.95 for AAAS members; $17.95 for others), 19th annual review of the Presidential R&D budget for the coming fiscal year. Written by AAAS staff members and others based in various Washington outposts of science and higher education, the individual chapters examine money, trends, and policies in federal R&D agencies, and also look at the effects on scientific and engineering disciplines. The Congressional verdict on the '95 budget won't be in until late summer, at the earliest, but apart from a rare event like cancellation of the Superconducting Super Collider, Congress usually makes only minor changes in the Presidential requests for R&D. The volume was published in conjunction with the annual AAAS Colloquium on the federal R&D budget, April 6-8, at which government officials extolled the soundness of their programs. Their words will be preserved in a new annual volume, *AAAS Science and Technology Policy Yearbook*, while the budget outcome will be reported by the AAAS late in the year in *Congressional Action on Research and Development in the Fiscal 1995 Budget*.

Order from: AAAS Distribution Center, Post Office Box 521, Annapolis Junction, Md. 20701; tel. 1/800-222-7809; fax 301/206-9789.

FY 1995 Budgets for Social and Behavioral Research (36 pp., $10), from the Consortium of Social Science Associations (COSSA), Washington-based monitor of what's happening financially and politically in those disciplines, a detailed review of relevant spending plans for next year in 36 federal agencies. Also available, without charge: COSSA's 1993 ***Annual Report***, which summarizes Congressional hearings, legislation, program changes, and other activities concerning the social and behavioral sciences.

Order from: Consortium of Social Science Associations, 1522 K St. NW, Suite 836, Washington, DC 20005; tel. 202/842-3525; fax 202/842-2788.

Major Award Decisionmaking at the National Science Foundation (160 pp., $35, plus $4 for shipping), mandated by Congress, and carried out by the National Academy of Sciences, this report credits NSF with generally sage performance in selecting big projects, defined as costing at least $1.5 million a year or $6 million over five years. But it notes that controversies have arisen over several major decisions, including the $60 million award in 1990 to a consortium headed by Florida State University to build and operate the National High Magnetic Field Laboratory. MIT, favored by NSF's peer reviewers, feels it was robbed—and instigated this study of NSF's procedures. The report doesn't discuss the merits of the Florida victory or nine other mega-verdicts examined in the study. It says, however, that NSF and the National Science Board, which must approve big projects, should regard technical merit as the most important criterion, with close attention to the impact on NSF's resources and educational opportunities, particularly for women and minorities. Calling for clearly stated ground rules in choosing projects and openness in deciding who gets them, the report cautions, "If confidence in the system is not maintained, the temptation for research institutions to try to have Congress preempt NSF decisionmaking will increase..." The report was produced by a panel chaired by Robert H. Rutford, President of the University of Texas, Dallas; Michael McGeary of the Academy staff served as Study Director.

Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1/800-624-6242; in the Washington, DC, area: 202/334-3313.

1994 Briefing Book on Environmental and Energy Legislation (236 pp., plus four updates, $75), from the Environmental and Energy Study Institute, a non-profit with deep "green" credentials, a review of environmental and energy issues on the political agenda, with some 30 concise papers on water resources, acid rain, natural gas, wildlife conservation, etc., plus summaries of relevant federal legislation. There's also a review of the federal budget process and membership lists of Congressional committees with jurisdictions on these matters.

Order from: Environmental and Energy Study Institute, 122 C St. NW, Suite 700, Washington, DC 20001; Attn. Box P; tel. 202/628-1400; fax 202/628-1825.

New Jersey Commission on Science and Technology Quarterly Report (12 pp., no charge), newsletter of one of the most vigorous state programs for using science and technology to promote economic growth. The March issue reports on financial awards to firms, linkups between organizations, personnel changes, and assorted entrepreneurial tidbits. There's also a directory of state centers for biotechnology, advanced materials, environmental protection technologies, information technologies, and venture development.

Order from: New Jersey Commission on Science and Technology, 20 West State Street, CN 832, Trenton, New Jersey 08625; tel. 609/984-1671; fax 609/292-5920.

Mental Illnesses Awareness Guide for Decision Makers (40 pp., $3), from the American Psychiatric Association, campaigning to assure ample inclusion of the services provided by its members in health-reform legislation. Addressed to "Dear Decision Maker," the publication asserts that "people with a mental illness should have the same access to medically appropriate care, with the same limits, as people with any other illness." The contents cover the incidence of mental-illness diagnoses, symptoms and disabilities, costs of care, etc.

Order from: American Psychiatric Association, Division of Public Affairs, 1400 K St. NW, Washington, DC 20005; tel. 202/682-6220; fax 202/682-6255.

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